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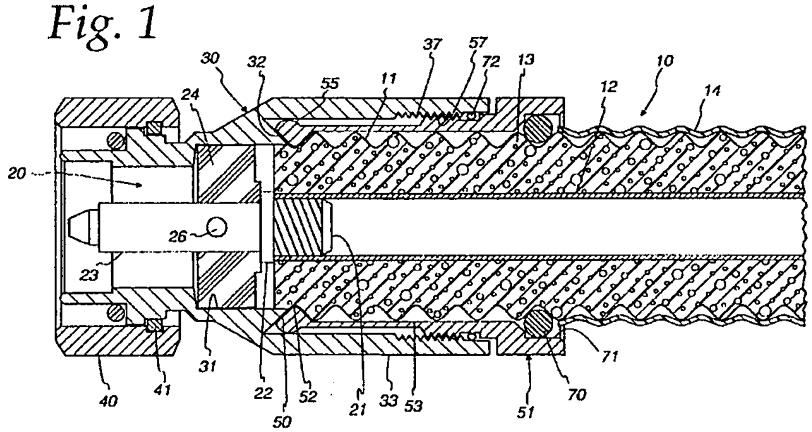
(54) **Connector for coaxial cable**

(57) In accordance with the present invention, the foregoing objectives are realized by providing a connector assembly comprising an outer connector for engaging the outer conductor of the cable, an inner connector having a threaded portion adapted to fit into the hollow inner conductor in threaded engagement with the interior surface of the inner conductor, the threads comprising a plurality of interleaved concentric threads, and a dielectric spacer between the inner and outer connectors. In a preferred embodiment, the multiple interleaved threads are self-tapping threads so that the inner connector can be simply threaded into the hollow inner conductor without any advance tapping of the inner conductor.

Fig. 1



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Description

FIELD OF THE INVENTION

The present invention relates generally to connectors for coaxial cables, and, more particularly, to an improved connector having mechanical features allowing for efficient installation. The invention also relates to methods of attaching such connectors and cables, and to the resulting assemblies.

BACKGROUND OF THE INVENTION

Coaxial cable is characterized by having an inner conductor, an outer conductor, and an insulator between the inner and outer conductors. The inner conductor may be hollow or may be solid. At the end of coaxial cable, a connector is attached to allow for mechanical and electrical coupling of the coaxial cable.

Connectors for coaxial cables having hollow inner conductors have been used throughout the semi-flexible coaxial cable industry for a number of years. For example, Rauwolf U.S. Patent No. 5,167,533 describes a connector for coaxial cables having hollow inner conductors. Vaccaro et al. U.S. Patent No. 5,154,636 describes a connector for coaxial cables having helically corrugated outer conductors. Doles U.S. Patent No. 5,137,470 describes a connector for coaxial cables having hollow and helically corrugated inner conductors. Juds et al. U.S. Patent No. 4,046,451 describes a connector for coaxial cables having annularly corrugated outer conductors and plain cylindrical inner conductors. Van Dyke U.S. Patent No. 3,291,895 describes a connector for cables having helically corrugated outer conductors and hollow, helically corrugated inner conductors. A connector for a coaxial cable having a helically corrugated outer conductor and a hollow, plain cylindrical inner conductor is described in Johnson et al. U.S. Patent No. 3,199,061.

The Johnson et al. patent describes a self-tapping connector for the inner conductor of the coaxial cable. Such connectors are time-consuming to install and expensive to manufacture. Also, when the inner connector is made of brass, overtightening causes the threads to strip off the connector rather than the end portion of the inner conductor of the cable, and thus the connector must be replaced.

SUMMARY OF THE INVENTION

It is a primary object of the invention is to provide an improved coaxial cable connector which can be installed easily and quickly.

Another object is to provide an improved connector including an inner connector with a self-tapping region that allows for easy connection to a coaxial cable having a hollow inner connector. A related object is for such an improved connector to be self-locating as it is applied to the end of a coaxial cable, and which can be easily installed by hand. A further related object of this invention is to provide an improved connector in which overtightening results in stripping of the threads formed in the hollow inner conductor in the cable rather than the connector.

Yet a further object of the invention is to provide an improved connector assembly which allows the outer connector to make good electrical contact and maintain that contact with the outer conductor of a coaxial cable with a minimal amount of effort by the installer.

Another object of this invention is to provide an improved method of attaching a connector assembly to a coaxial cable having a hollow inner conductor, so that good electrical contact is maintained between the inner connector and inner conductor of the cable over a long operating life.

It is still another object of this invention to provide an improved method of attaching the outer conductor of the cable to the outer connector of the connector assembly with a minimal amount of effort while making good electrical contact therebetween.

It is another object of the invention to provide an improved connector which can be efficiently and economically manufactured at a relatively low cost.

Other objects and advantages of the invention will be apparent from the following detailed description and the accompanying drawings.

In accordance with the present invention, the foregoing objectives are realized by providing a connector assembly having an outer connector for engaging the outer conductor of the cable, an inner connector having a threaded portion adapted to fit into a hollow inner conductor in threaded engagement with the interior surface of the inner conductor. The threaded portion includes a plurality of interleaved concentric threads. A dielectric spacer is disposed between the inner and outer connectors. In a preferred embodiment, the multiple interleaved threads are self-tapping threads so that the inner connector can be simply threaded into the hollow inner conductor without any advance tapping of the inner conductor.

Furthermore, the outer connector of the connector assembly may include two members that can be threadably attached via a plurality of interleaved concentric threads formed on each of the two members. The plurality of threads provides for easy attachment of the two members while maintaining good electrical contact between each member of the outer connector and outer conductor of the cable.

The inner connector is preferably made of a relatively hard conductive alloy, such as a copper-zinc alloy (e.g., UNS-C67400) or a beryllium-copper alloy (e.g., UNS-C17300). The use of such materials facilitates the self-tapping operation, and also protects the connector in the event of overtightening because the threads will strip on the conductor before they strip on the connector. Thus, the connector can be re-installed, after cutting off a short length of the end of the conductor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation, partially in section, of a connector embodying the present invention, and a coaxial cable for receiving the connector;

FIG. 2 is an enlarged side elevation of the end portion of a metal rod that has been machined to form the connector of FIG. 1, prior to the forming of the threads on the connector;

FIG. 3 is an enlarged side elevation of the metal rod shown in FIG. 2, after the forming of the threads;

FIG. 4 is an end elevation of the connector shown in FIG. 3;

FIG. 5 is an isometric view, partially cut away, of the connector assembly embodying the present invention;

FIG. 6 is a view of the unrolled interleaved threads from one member of the connector assembly; and

FIG. 7 is a view of the unrolled interleaved threads from the other member of the connector assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

While the invention is susceptible to various modifications and alternative forms, a specific embodiment thereof has been shown by way of example in the drawings and will be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular form described, but, on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

Turning now to the drawings, there is shown a connector assembly for a coaxial cable 10 having an annularly corrugated outer conductor 11 concentrically spaced from a hollow inner conductor 12 by a foam dielectric 13. As is well known to those familiar with this art, an "annularly" corrugated conductor is distinguished from a "helically" corrugated conductor in that the annular corrugations form a series of spaced parallel crests which are discontinuous along the length of the cable, and, similarly, a series of spaced parallel valleys which are also discontinuous along the length of the cable. That is, each crest and valley extends around the circumference of the conductor only once, until it meets itself, and does not continue in the longitudinal direction. Consequently, any transverse cross-section taken through the conductor perpendicular to its axis is radially symmetrical, which is not true of helically corrugated conductors.

To prepare the cable 10 for attachment of the connector assembly, the end of the cable is cut along a plane extending through the apex of one of the crests of the corrugated outer conductor and perpendicular to the axis of the cable. This exposes the clean and somewhat flared interleaved surface of the outer conductor 11. The foam dielectric 13 normally does not fill the crests of the corrugated outer conductor 11, so a small area of the inner surface of the outer conductor is exposed adjacent the cut end of this conductor at the apex of the crest through which the cut is made. However, if the foam dielectric does fill the entire crest, then a portion of the dielectric should be removed to permit contact with the inner surface of the outer conductor 11 adjacent the cut end thereof. Any burrs or rough edges on the cut ends of the metal conductors are preferably removed to avoid interference with the connector. The outer surface of the outer conductor 11 is normally covered with a plastic jacket 14 which is trimmed away from the end of the outer conductor 11 along a sufficient length to accommodate the connector assembly.

Electrical contact with the inner conductor 12 of the cable 10 is effected by an inner connector element 20 having an anchoring member 21. When the inner conductor 12 of the cable 12 is hollow as it is shown in FIG. 1, the anchoring member 21 includes a threaded portion. In a preferred embodiment, the threaded portion is self-tapping as it is threaded into the hollow inner conductor 12. An enlarged collar 22 engages the end of the inner conductor 12 and an elongated pin 23 connects the inner conductor 12 to a conventional complementary female member (not shown). An insulator 24 assists in centering the pin 23 within the main body member 30 of the connector assembly while electrically isolating these two elements from each other. It will be noted that the interior of the body member 30 includes a recess 31 for receiving the insulator 24, which is also conventional in the art of coaxial cable connectors. The inner connector 20 is described in further detail with reference to FIGS. 2-4.

A coupling nut 40 secured to the body member 30 around the pin 23 is a conventional fitting, and is secured to the body member 30 by a spring retaining ring 41 which holds the nut 40 captive on the body member 30 while permitting free rotation of the nut 40 on the body member 30. As will be apparent from the ensuing description, this coupling nut 40 serves as a part of the electrical connection to the outer conductor 11 of the cable 10, and is insulated from the inner conductor 12 by the insulator 24 carried by the inner connector pin 23.

The body member 30 includes a conically beveled clamping surface 32 which engages the inner surface of the outer conductor 11. This clamping surface 32 is formed as an integral part of the interior surface of the body member 30, and is continuous around the entire circumference of the cable to ensure good electrical contact with the inner surface of the outer conductor 11. Cooperating with the beveled clamping surface 32 is a second clamping surface 50 formed on one end of an annular clamping member 51 for engaging the outer surface of the outer conductor 11. More specifically, this second clamping surface 50 is formed on one side of an inner bead 52 which projects from the inside surface of the clamping member 51 into the last valley of the corrugated outer conductor 11 adjacent the end of the

cable so as to lock the clamping member 51 to the cable 10 in the axial direction. The body member 30 and the clamping member 51 comprise an outer connector which is coupled to the outer conductor 11.

For the purpose of drawing the beveled clamping surface 32 and the second clamping surface 50 firmly against opposite sides of the flared end portion of the outer conductor 11, the two members 30 and 51 include respective telescoping sleeve portions 33 and 53 with cooperating threaded surfaces 37 and 57. Thus, when the two members 30 and 51 are rotated relative to each other in a first direction so as to engage threaded surface 37 with threaded surface 57, they are advanced toward each other in the axial direction so as to draw the clamping surfaces 32 and 50 into electrically conductive engagement with the outer conductor 11. When the annular flared end portion of the outer conductor 11 is clamped between the beveled surface 32 and the second clamping surface 50, it is also flattened to conform to the planar configuration of the clamping surfaces 32 and 50. To detach the connector assembly from the outer conductor 11, the two members 30 and 51 are simply rotated relative to each other in the opposite direction to retract the two members 30 and 51 away from each other until the threaded surfaces 37 and 57 are disengaged to permit inner bead 52 to pass over the crest of the corrugated outer conductor 11 as the clamping member 51 is advanced longitudinally over the end of the cable 10.

The threaded surfaces 37 and 57 each may include a single thread. In a preferred embodiment, however, the threaded surface 37 of the main body member 30 and the threaded surface 57 of the clamping member 51 each include a plurality of interleaved concentric threads. Due to the plurality of threads, the clamping member 51 and the main body member 30 are quickly advanced toward each in the axial direction when clamping the annular end of the outer conductor 11 therebetween. Typically, the axial length of the threaded surface 37 of the main body member 30 is greater than the axial length of the threaded surface 57 of the clamping member 51. The threaded surfaces 37 and 57 are described in more detail with reference to FIGS. 6 and 7 which illustrate the threaded surfaces 37 and 57 in unrolled, planar views.

For the purpose of avoiding rotation of the clamping member 51 around the cable 10 while the body member 30 is threaded thereover, a raised bead 55 projects from the outer surface of the member 51. As can be seen in FIG. 1, the raised bead 55 minimizes the area of frictional engagement between the two members 30 and 51, and spaces the unthreaded portions of the opposed surfaces of these two members 30 and 51 away from each other. After the two members 30 and 51 are threaded together, the engagement of the inner surface of the body member 30 with the raised bead 55 maintains the locking action of the inner bead 52 by preventing any outward deflection of the resilient segments as long as the two member 30 and 51 remain connected.

To provide a moisture barrier between the inner surface of the clamping member 51 and the outer surface of the cable conductor 11, an O-ring 70 is positioned in a valley on the exposed portion of the outer conductor 11 before the clamping member 51 is applied thereto. Then when the clamping member 51 is installed on the cable 10, it slightly compresses the rubber O-ring 70 so that the O-ring 70 bears firmly against both the outer surface of the conductor 11 and the inner surface of the clamping member 51. The adjacent end portion of the clamping member 51 forms a slightly enlarged recess 71 so that it can fit over the end of the plastic jacket 14 on the coaxial cable. A moisture barrier similar to that provided by the resilient O-ring 70 is provided by a second O-ring 72 positioned between the opposed surfaces of the sleeve portions 33 and 53 of the body member 30 and clamping member 51, respectively.

Returning now to the inner connector 20 which makes electrical contact with the inner conductor 12, the threaded anchoring member 21 is self-tapping so that the connector 20 can be installed by simply turning it into the hollow inner conductor 12 until the shoulder 25 (FIGS. 2-4) formed by the collar 22 engages the cut end of the inner conductor 12. A diametrical hole 26 is formed in the body portion of the connector 20 for receiving a tommy bar wrench for turning the inner connector 20 into the inner conductor 12.

The threaded portion 80 of the anchoring member 21 includes four interleaved concentric threads 81, 82, 83 and 84 which are equally spaced from each other along the length of the connector. Each of the four threads 81-84 has the same lead, but, as can be seen in FIG. 4, the ends of the four threads are spaced 90 degrees from each other. Thus, the ends of the four threads 81-84 are symmetrically spaced from each other around the axis of the connector assembly.

As can be seen most clearly from FIG. 2, which is a side elevation of the inner connector 20 before it has been threaded, the anchoring member 21 includes a tapered distal end 90, a recessed region 91, a raised region 92, and a second recessed region 93. When the connector 20 is threaded, the threading tool is maintained at a constant distance from the axis of the connector, so that the distance between the axis of the connector and the troughs of the threads 81-84 remains constant throughout the entire threaded portion 21. The taper of the threading tool and the thread dimensions are selected so that the cross-sectional profile of the threads in the raised region 92 has an inverted V shape, i.e., the crest of each thread forms an inverted V so that there is essentially no flat surface along the thread crest (in a preferred embodiment the crest of the thread forms a flat surface that is only 0.003 inch wide). It is this region 92 and a tapered region 91a located between recessed region 91 and region 92 of the threads that are self-tapping, and the sharp V profile of the crests of the threads in this region assist in cutting into the inner wall of the hollow inner conductor 12. The crests of the threads in the region 92 lie in a cylindrical plane that has

the same diameter as the region 92 in the unthreaded part shown in FIG. 2. This diameter is slightly larger than the inside diameter of the hollow conductor 12 so that the threads penetrate into the metal of the inside wall of the conductor. The depth of penetration of these threads into the inside wall of the inner conductor 12 is preferably at least 0.005 inch.

When the inner connector 20 is inserted into the hollow inner conductor 12, the tapered end 90 and the recessed region 91 enter the conductor before the region 92. The tapered end 90 facilitates the initial entry of the connector 20 into the hollow conductor 12. The region 91 has a diameter that is the same as, or only slightly smaller than, the inside diameter of the hollow conductor 12 so that the crests of the threads in this region 91 slide on the inside wall of the hollow conductor 12. Because the diameter of this region 91 is smaller than the diameter of region 92, and all the threads are formed by the same threading tool, the crests of the threads in the region 91 have relatively flat surfaces, as can be seen in FIG. 3.

Because the region 91 of the connector 20 fits snugly within the hollow conductor 12, the inner connector 20 is centered in coaxial alignment with the conductor 12 before the self-tapping threads in the tapered region 91a and region 92 begin to cut into the metal of the inside wall of the conductor. This ensures that the plane of the shoulder 25 is perpendicular to the axis of the conductor 12. The flat surfaces on the thread crests in the region 91 also help to center the connector coaxially within the conductor 12.

In the tapered region 91a, the flat surface on the crests of the threads in region 91 transition to the sharp, pointed thread crests in the region 92.

To enable the shoulder 25 to fit snugly against the cut end of the inner conductor 12, the region 93 has the same reduced diameter as the region 91. A short tapered region 94 between the end of the most proximal threaded region 93 and the shoulder 25 flares the cut end of the inner conductor 12 slightly outwardly to ensure parallelism between the centerlines of the conductor 12 and the connector 20. In addition, the tapered region 94 ensures firm engagement between the end of the conductor 12 and the connector shoulder 25.

As the inner connector 20 is threaded into the hollow inner conductor 12, all four threads 81-84 cut into the inside wall of the conductor. The lead of the four threads 81-84 can be made considerably longer than the lead of a single-threaded connector. As a result, each complete revolution of the multiple-thread connector 20 relative to the conductor 12 advances the connector 20 farther into the conductor. Indeed, in most applications, a single revolution of the connector is sufficient to firmly attach the inner connector 20 to the conductor 12, thereby shortening the installation time with corresponding reductions in installation costs. In a preferred embodiment, the lead of the threaded portion 31 is about 0.160 inch, and the axial length of the region 92, including the two adjacent tapers, is about 0.0655 inch.

As in most connector assemblies, the shapes and dimensions of the various parts are selected to provide impedance matching between adjoining parts, so that the complete connector and cable assembly has a low VSWR.

FIG. 5 illustrates the connector assembly with the body member 30 and the clamping member 51 disassembled. A portion of the main body member 30 has been broken away to reveal its threaded surface 37. The telescopic sleeve portion 33 of the body member 30 slides over the sleeve portion 53 of the clamping member 51. The threaded surface 57 of the clamping member 51 matches the threaded surface 37 on the telescopic sleeve portion 33 of the body member 30.

A plurality of slits 60 extend through a substantial length of the sleeve portion 53 of the clamping member 51 to a point near the threaded surface 57. The slits 60 thus form a plurality of resilient segments which act like spring fingers when a radial force is applied thereto. Consequently, when the sleeve portion 53 of the clamping member 51 is slipped over the cable 10 with the inner bead 52 engaging the cut edge of the outer conductor 11 as illustrated in FIG. 1, continued application of pressure to the member 51 causes the resilient segments to be deflected radially outwardly until the inner bead 52 clears the crest at the end of the corrugated outer conductor 11. The bead 52 then slides over the crest of the outer conductor 11 and snaps into the last corrugation valley, as illustrated in FIG. 1, thereby locking the clamping member 51 to the cable 10 in the axial direction.

The raised bead 55 is formed on the sleeve portion 53 of the clamping member 51 near the end of the slits 60. The inner bead 52 extends inwardly from the end of the sleeve portion 53 of the clamping member 51 in a direction generally away from the raised bead 55. The second clamping surface 50 which engages the beveled clamping surface 32 (not shown) of the body member 30 is adjacent the inner bead 52.

FIGS. 6 and 7 illustrate the threaded surface 37 along the inside of the body member 30 and the threaded surface 57 of the clamping member 51 in unrolled, planar views. Four separate threads 37a-37d form the internally threaded surface 37 of the main body 30 (FIG. 7) and four corresponding threads 57a-57d form the externally threaded surface 57 (FIG. 8) of the clamping member 51. Because the ends of the threads are typically uniformly spaced around each member, the ends of the four threads for each threaded surface 37 and 57 are substantially 90° apart.

In general, fewer than two full revolutions are needed for complete engagement of the outer conductor 11 by the beveled clamping surface 32 and the second clamping surface 50. Typically, between 0.75 revolution (270 degrees) and 1.5 revolutions (540 degrees) are required for complete engagement of the outer conductor 11 by the beveled clamping surface 32 and the second clamping surface 50. In a preferred

embodiment with four threads, approximately one revolution of the clamping member 51 effects complete engagement of the clamping surfaces 32 and 52.

Due to the utilization of multiple threads (e.g. four threads), the clamping member 51 is attached to the body member 30 with a minimal amount of effort. Therefore, the time required to assemble the outer connector to the cable 10 is reduced which decreases the overall installation cost. This reduced effort required for installation is also beneficial when the installer is performing this task in a spatially-confined area or in inclement environmental conditions wherein multiple revolutions of the clamping member 51 relative to the main body member 30 may be difficult.

Furthermore, because there is less engagement between each of the plurality of threads and its corresponding thread since roughly one revolution is needed to fully advance the clamping member 51 relative to the main body member 30, the frictional wear on each of the threads is reduced. This is advantageous when the connector assembly is recycled for multiple uses. On the other hand, if a signal thread were used, the multiple revolutions needed to advance the clamping member 51 relative to the main body member 30 would result in additional wear on the single thread.

The threads 57a-57d of the clamping member 51 and the threads 37a-37d of the main body member 30 have a pitch in the range from approximately 0.0625 inch to approximately 0.05 inch. The preferred pitch is about 0.055 inch. In the preferred embodiment where four threads are used, the lead, which is the pitch multiplied by the number of threads, is approximately 0.222 inch. If it is desired to maintain the lead constant at about 0.222 inch, but change the number of threads, then the pitch could change accordingly.

Although the number of interleaved concentric threads shown is four, the number of threads can vary to accomplish the same result. Also, the threads do not need to include ends which are uniformly spaced as long as the corresponding threads of the mating piece have the same spatial relationship at their ends.

Claims

1. A connector assembly for a coaxial cable having an outer conductor and an inner conductor, said connector assembly comprising:

   an outer connector for engaging said outer conductor of said coaxial cable;
   an inner connector for engaging said inner conductor of said coaxial cable to form an electrical contact with said inner conductor; and
   a threaded portion having a plurality of concentric threads on at least one of said inner and outer connectors, said plurality of threads for bringing said at least one of said inner and outer connectors into engagement with the corresponding one of said inner and outer conductors.

2. The connector assembly of claim 1 wherein said threaded portion is located on said inner connector.

3. The connector assembly of claim 2 wherein said plurality of threads are self-tapping.

4. The connector assembly of claim 2 wherein said threaded portion has a distal section and a proximal section, the distal section having a smaller diameter than the proximal section.

5. The connector assembly of claim 4 wherein the interior surface of said hollow inner conductor has an outside diameter, said distal section having a diameter equal to or slightly smaller than the inside diameter of said hollow inner conductor, said proximal section having a diameter slightly greater than the inside diameter of said hollow inner conductor.

6. The connector assembly of claim 2 wherein said threaded portion includes a proximal end and said inner connector includes an outwardly extending flange adjacent the proximal end of the threaded portion for engaging the inner conductor and thereby limiting movement of the inner connector into the inner conductor.

7. The connector assembly of claim 2 wherein said outer connector includes at least two components that are brought into engagement by mating threads.

8. The connector assembly of claim 2 wherein said hollow inner conductor is made of a first material and said threaded portion of said inner connector is made of a second material, said second material having a greater hardness than said first material.

9. The connector assembly of claim 1, wherein said threaded portion is located on said outer connector.

10. The connector assembly of claim 9, wherein said outer connector includes a main body member and a clamping member, said main body member and said clamping member each include said threaded portions providing mating of said main body member to said clamping member.

11. The connector assembly of claim 10, wherein said plurality of threads includes at least four threads.

12. The connector assembly of claim 10, wherein said outer conductor is in complete engagement with said outer connector in response to rotation of said clamping member relative to said main body member by an amount less than two revolutions.

13. The connector assembly of claim 10, wherein said threaded portion of said main body member is internal on said main body member, and said threaded portion of said clamping member is external on said clamping member.

14. A connector assembly of claim 10, wherein said inner connector is brought into engagement with said inner conductor through the use of threads.

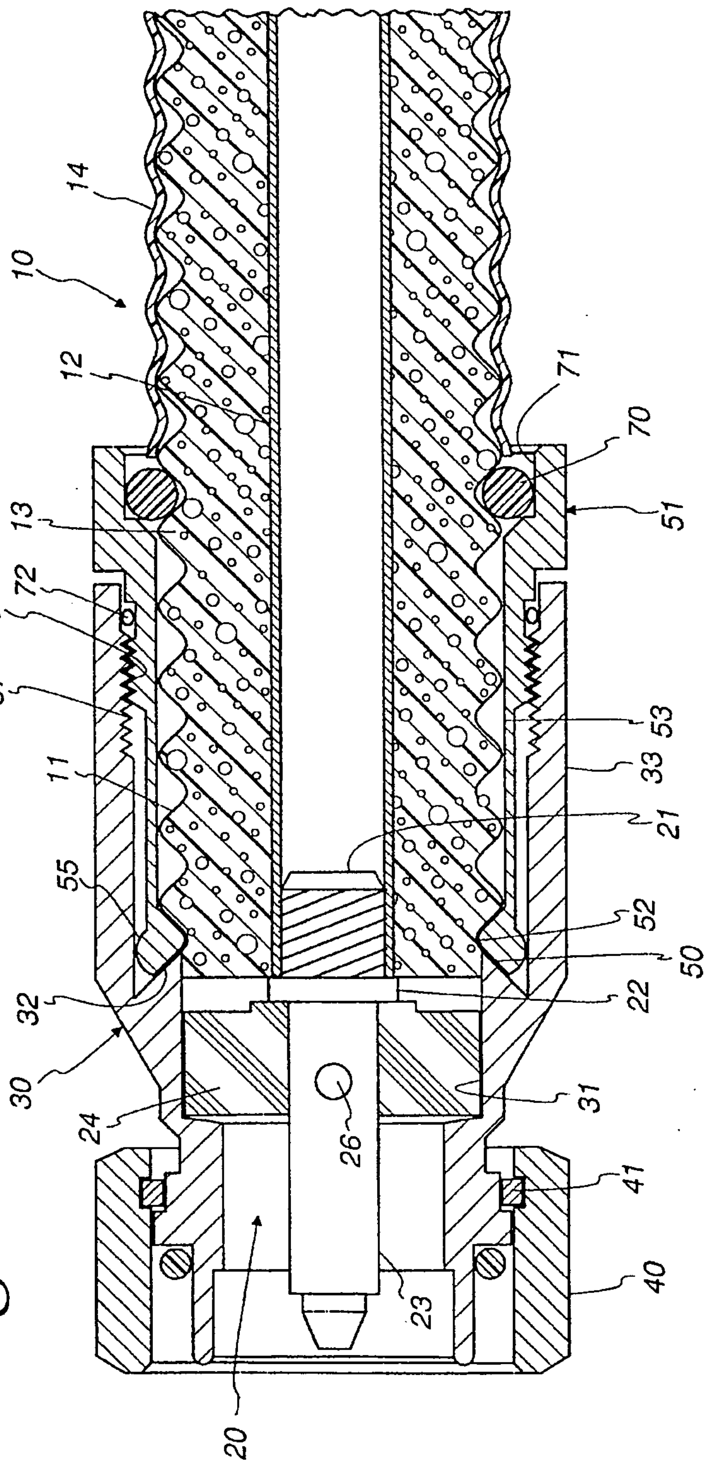
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Fig. 1

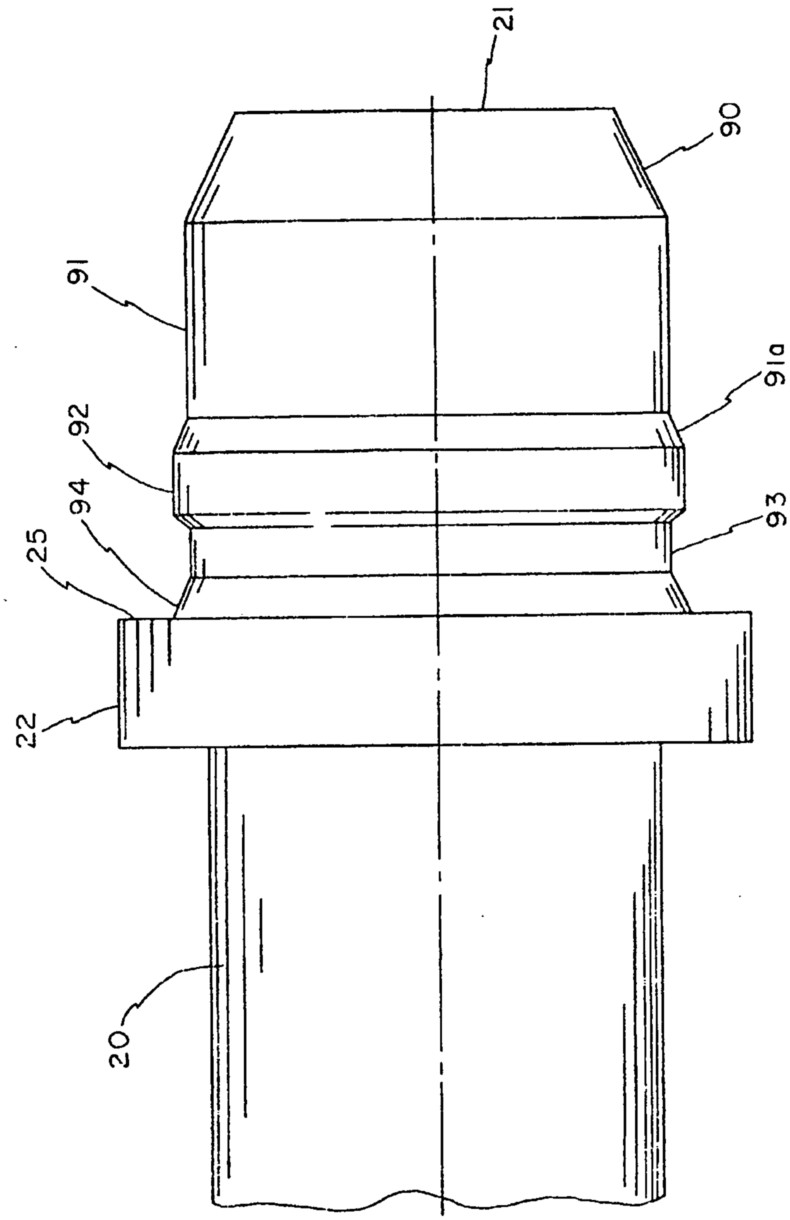


FIG. 2

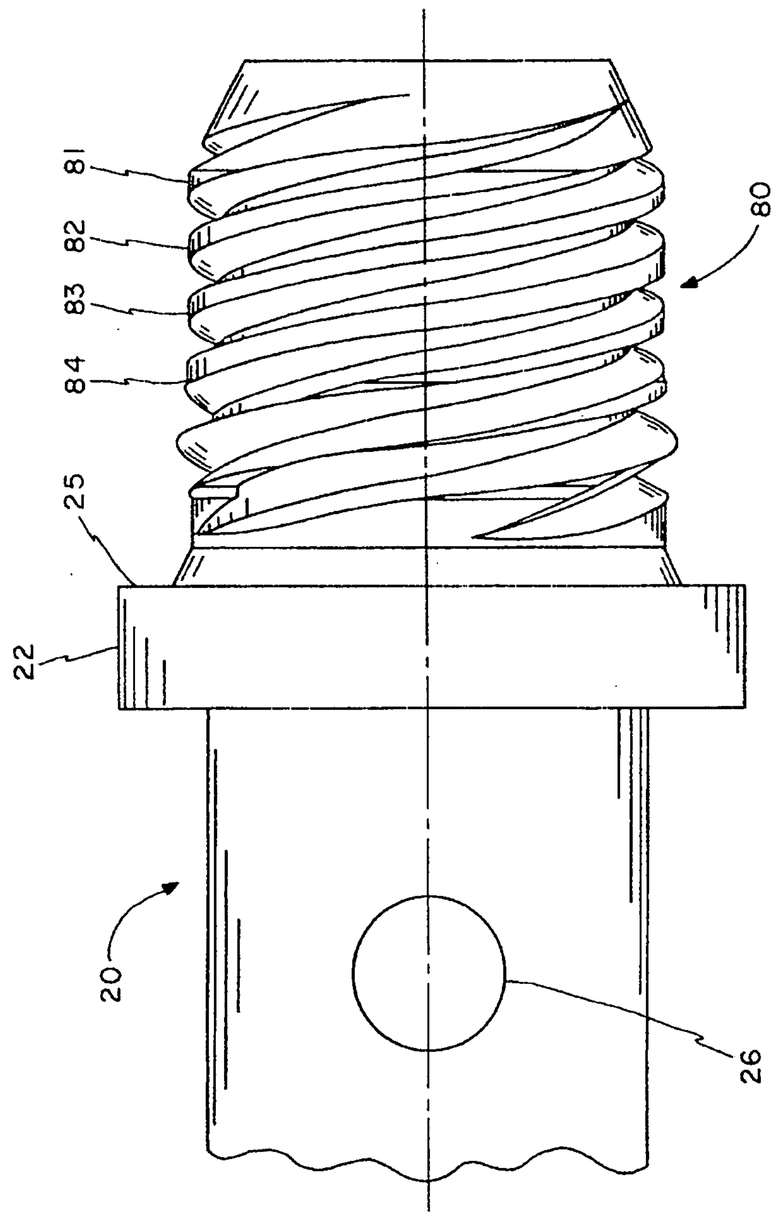


FIG. 3

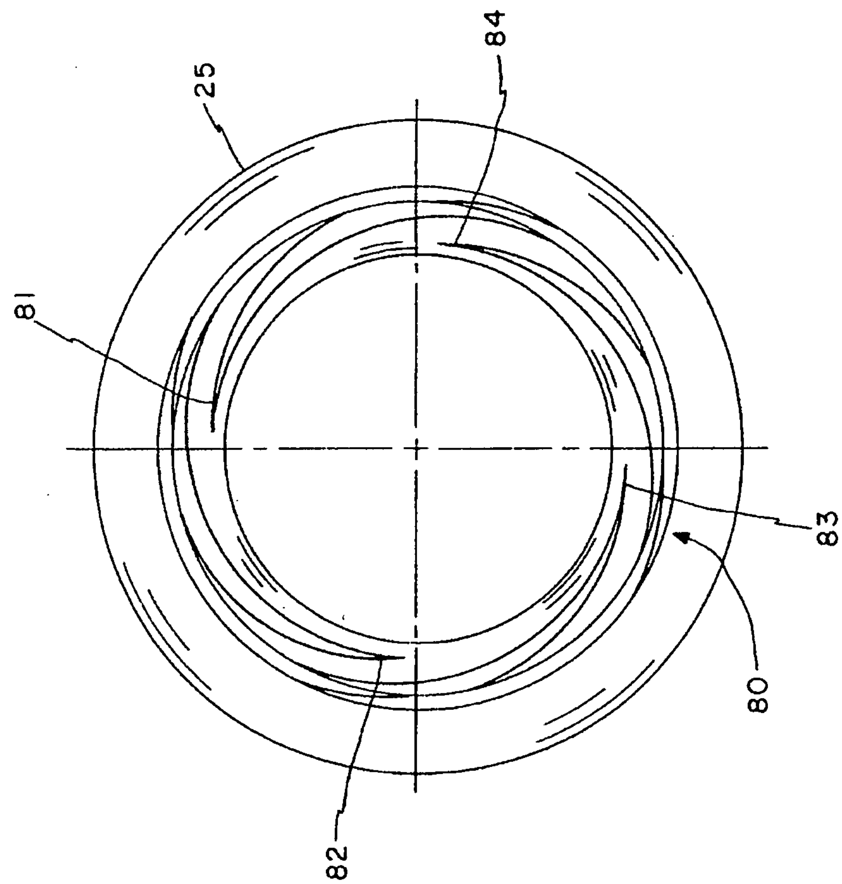


FIG. 4

Fig. 5

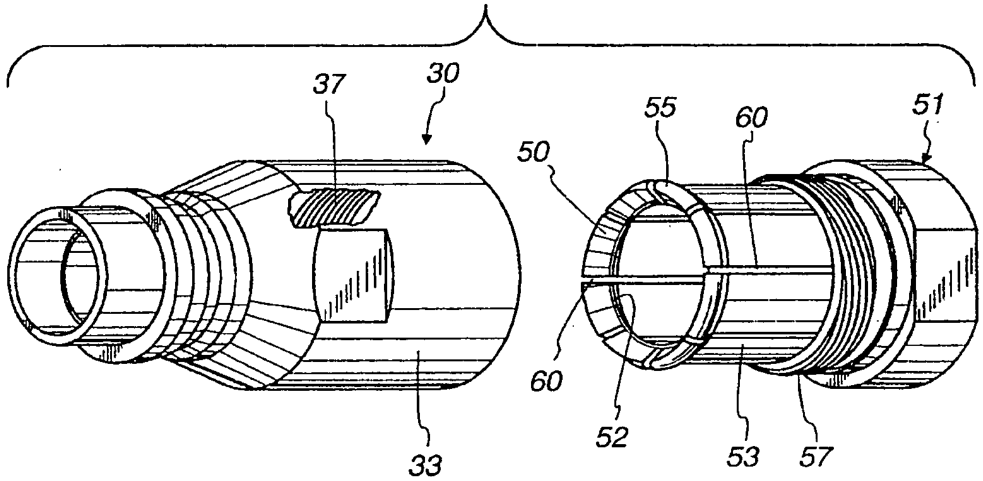


Fig. 6

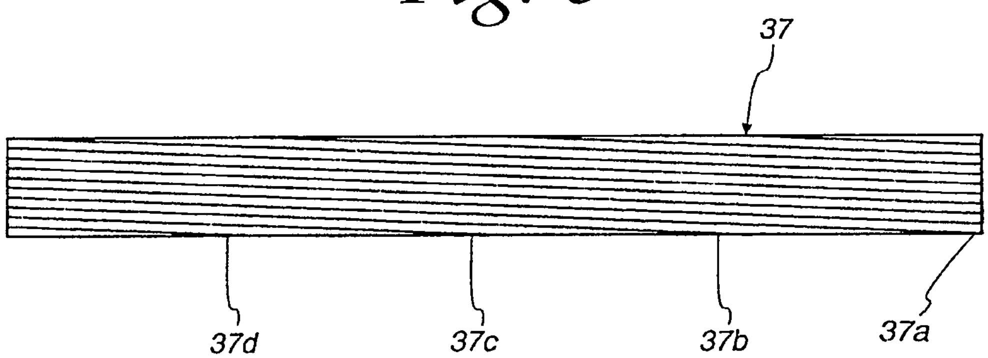
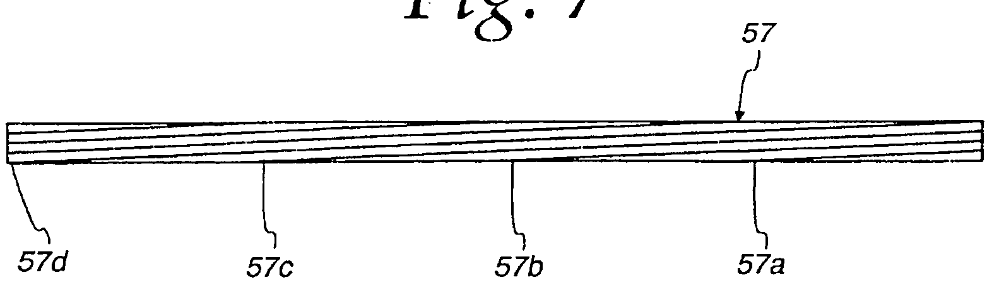


Fig. 7



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(54) Connector for coaxial cable

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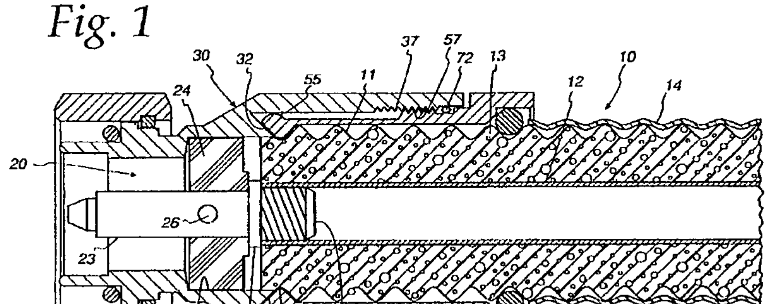
Fig. 1



EP 0 757 408 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 2216

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	DE 43 43 229 A (SPINNER GMBH ELEKTROTECH) 8 December 1994 * claims; figures *	1,2,9 3,6-8	H01R9/05 H01R17/12
Y	US 5 334 051 A (DEVINE EDWARD B ET AL) 2 August 1994 * claims; figures *	1	
A,D	US 4 046 451 A (JUDS RICHARD C ET AL) 6 September 1977 * claims; figures *	1	
A,D	US 5 167 533 A (RAUWOLF GERALD A) 1 December 1992 * claims; figures *	1	
A,D	US 5 154 636 A (VACCARO RONALD A ET AL) 13 October 1992 * claims; figures *	1	
A,D	US 3 199 061 A (E.H.JOHNSON) 3 August 1965 * claims; figures *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A,D	US 3 291 895 A (P.F.VANDYKE) 13 December 1966 * claims; figures *	1	H01R
A,D	US 5 137 470 A (DOLES CONNIE S) 11 August 1992 * claims; figures *	1	
Y	US 5 354 217 A (GABEL LEE R ET AL) 11 October 1994 * claims; figures *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 March 1998	Pfahler, R

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